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**EVIDENCE**

## Tuesday, September 18, 2018

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**Chair**

**Mr. Pat Finnigan**

# Standing Committee on Agriculture and Agri-Food

**Tuesday, September 18, 2018**

● (0845)

[*English*]

**The Chair (Mr. Pat Finnigan (Miramichi—Grand Lake, Lib.)):** Welcome to the fall session of our agriculture committee.

I want to welcome everyone back. We have some new people around the table, at least for today.

[*Translation*]

Mr. Godin, welcome to our committee.

[*English*]

I hope everyone had a chance to relax, but maybe also to visit some farms and markets this summer, as well as to thank a farmer. I hope we all had a chance to do that; we all have that in common.

[*Translation*]

This morning, we are continuing our work on the advancements of technology

[*English*]

and research in the agricultural industry that can support Canadian exports.

With us this morning, from Colleges and Institutes Canada, we have Mr. Stuart Cullum, president, Olds College. Welcome, Mr. Cullum.

We also have Christine Trauttmansdorff, vice-president, government relations and Canadian partnerships. Welcome, Christine.

On video conference, we have Mr. Tyler Hopson. He might appear very far away, but as soon as he gets to speak it should focus on him. We should be able to, if not hear him, read his lips.

Welcome, Mr. Hopson. Can you hear us today?

**Mr. Tyler Hopson (Public Affairs Manager, Mosaic):** I can.

Good morning.

**The Chair:** We'll start with a seven-minute opening statement.

Mr. Cullum, you can get things going.

**Mr. Stuart Cullum (President, Olds College, Colleges and Institutes Canada):** Thank you.

I'll turn it over to my colleague.

**Ms. Christine Trauttmansdorff (Vice-President, Government Relations and Canadian Partnerships, Colleges and Institutes Canada):** Thank you, Mr. Chair, for the invitation to appear this morning.

[*Translation*]

I am pleased to appear today on behalf of Colleges and Institutes Canada, an extensive network of post-secondary institutions from each province and territory, to which 3,000 urban, rural, remote and northern communities have access.

[*English*]

I am joined on this panel by Mr. Stuart Cullum, the president of Olds College in Alberta. We look forward to hearing from our colleagues from Niagara College later today and from Cégep de Victoriaville on Thursday.

We're going to tell you how our institutions are helping Canada achieve its ambitious goals for growing agriculture exports through advancements in technology and research, and offer recommendations to strengthen these contributions.

The government's innovation and skills plan states, "Innovative products, ideas or services only become real because of the creativity, work ethic and skill of the people who create them.... [W]e will need to build the world's most skilled, talented, creative and diverse workforce."

Colleges and Institutes Canada could not agree more. We are very conscious of labour shortages in the area, particularly if the market for exports expands as predicted. According to our colleagues at the Canadian Agricultural HR Council, this shortfall is expected to increase to 114,000 jobs by 2025. Filling this gap lies at the heart of the college mandate. Colleges offer over 350 certificate, diploma and degree programs related to agri-food. Over 50% of agriculture graduates are trained in a college or polytechnic institution.

This training is designed to provide the skills learners need to become innovators. No matter what program they're in, students tackle problems from an industry perspective and solve them using the latest equipment and technology. They benefit from their colleges' deep connections to employers, from the guidance of faculty who work in the industry, and from the hands-on experience they get through co-ops, work placements and campus-based enterprises. One of the most effective approaches to experiential learning is applied research, where students work with employers to create prototypes, develop products, implement new technology and improve services and processes.

The benefits of applied research extend far beyond the student. Budget 2018 recognized this, making an important new investment of over $140 million over five years. This will expand the availability of R and D services to SMEs and companies in rural areas, which often have difficulty accessing the innovation ecosystem. It will also allow more students to become agents of technology transfer, ready to take jobs that support innovation and growth and move the results and know-how they've gained through applied research out to new markets.

Our members have more than 215 research centres and 400 labs across the country. Over 40 of these are in the agri-food sector. Last year, they worked with 5,500 companies, 85% of which are SMEs. The industry partner almost always retains the IP, and the majority of projects are completed in under a year.

Stuart and the team from Niagara are going to describe what these facts and figures look like to the students, businesses and communities served by institutions like theirs.

We thank you for the opportunity to meet with you today, and we look forward to your questions and the report on this study.

I'll turn it over to Stuart.

● (0850)

**Mr. Stuart Cullum:** I would like to express my appreciation for the work of this committee. I concur with Ms. Trauttmansdorff that the colleges and institutes in Canada play a key role in support of applied research and innovation, and concurrently in the development and enhancement of the talent needed for our agriculture industry to compete globally.

Olds College has a 104-year-long history of delivering education and training in agriculture. We began as a learning institution and demonstration farm where technology and production practices were tried and exhibited for an industry that needed to become more efficient and productive. Today, a lot has changed, but the need for learning and applied research environments remains key to the success and competitiveness of our industry. Olds College continues to use its 2,000-acre campus and field-to-fork enterprise to support hands-on learning and applied research.

Through the proliferation of technology and big data, and the application of tools such as digital sensors, controls, artificial intelligence and machine learning in the agricultural sector, we believe that our post-secondary environment can be an aggregator of companies, research organizations and other post-secondary institutions for the development, application, integration and demonstration of these technologies. The effects of this collaborative approach will be seen through faster and more effective adoption by our industry and the development of world-class learning environments that deliver the talent needed to ensure our sector's global competitiveness.

A good example of this is found in the work of our Technology Access Centre for Livestock Production, which is focused on meeting the needs of the Canadian livestock industry by providing access to new technologies for increasing production efficiencies, industry sustainability and producer viability.

Funded through NSERC's college and community innovation program, Olds College has been able to work with other key organizations, such as the University of Alberta, where we recently completed a three-year project for improving feed efficiency in purebred Hereford cattle using genomic tools. This project also involved the Canadian Hereford Association, Livestock Gentec, Alberta Agriculture and Forestry, Cattleland Feedyards, and other industry partners. Nearly 1,200 Hereford bulls were phenotypically and genomically tested for feed efficiency in this project, a major undertaking that has built a unique capacity that will allow for the selection of feed-efficient cattle and world-class genetics that are marketable around the globe.

Olds College and our counterparts across the country are building innovation ecosystems that will advance industries and produce world-class talent. This is exemplified in another important initiative that was recently launched at our institution called the Olds College smart farm. In its first iteration of around 100 acres, we collaborated with 15 organizations from the agriculture and technology sector to install monitoring equipment, sensors, weather stations, Wi-Fi connectivity, data visualization and management capabilities. Our smart farm provides a venue where companies, entrepreneurs and producers can develop, demonstrate and integrate technology and practices.

The Olds College smart farm is already attracting a community of global partners and investors for this development, because we are also focusing on system-level issues. It will eventually expand to encompass the whole of the Olds College farm and will provide a unique, cutting-edge learning environment in Canada for post-secondary students and learners around the world to come to.

At Olds College, we know that our impact is greater when we work with others, and we are prepared to lead in aggregating communities around system-level issues and opportunities to enhance and scale our effects.

An example of this is demonstrated in how Olds College led an effort that brought together more than 100 organizations, including 17 post-secondary institutions from across Canada, and $80 million in committed industry investment in support of an agriculture supercluster focused on enhancing economically and environmentally sustainable agriculture and food production through the application and optimization of smart ag tools, technology and science.

While our supercluster bid was not successful, it was shortlisted to the final round, and our collective efforts have spawned other initiatives across the country, such as the recent launch of the Calgary-Olds smart agri-food corridor and the pan-prairie academic working group in collaboration with Protein Industries Canada and the Enterprise Machine Intelligence and Learning Initiative in Manitoba.

Mr. Chair, I believe that Olds College is an example of how colleges and institutes across Canada are developing and leading to support industry and grow talent for enhancing global competitiveness. The challenge that colleges and institutes have is not around demand and performance. Our own applied research activity is expected to double in the next seven years.

What we need—and this is our recommendation to this committee—is a reasonable level of stable funding for the development of our research environments, our engagement with partners and our administrative capacity. The demand is great. However, our capacity is stretched, and we can scale to meet our potential and bring these communities together only if we have what is required in our physical environments and our administration. This is a key need for the colleges and institutes in this country.

● (0855)

Mr. Chair and members of the committee, in closing I want to convey our strong commitment to the work of this committee, the government, our industry, community, and post-secondary partners to leverage the full potential of our institutions to enhance the development and adoption of technology and science for the global competitiveness of Canada's agriculture sector.

I look forward to our discussion. We would be pleased to take your questions.

Thank you.

**The Chair:** Thank you, Mr. Cullum.

Now from Mosaic, we have Mr. Tyler Hopson.

You have up to seven minutes.

**Mr. Tyler Hopson:** Thank you for the introduction, Mr. Chairman.

Good morning to the committee members. I appreciate your time and the invitation today.

My name is Tyler Hopson, and I am the public affairs manager for The Mosaic Company. We do appreciate the opportunity to be here today, after an attempt earlier in the year had to be rescheduled.

For those of you who aren't familiar with it, let me tell you a bit about Mosaic and the work we do. Mosaic is the world's largest combined producer and marketer of concentrated potash and phosphate fertilizers, with over 15,000 employees globally, about 2,200 of them in Saskatchewan. Our operations and joint ventures span nine countries. All of our Canadian operations produce potash.

We completed $7.4 billion in global sales in 2017. We have $3 billion in expansion projects under way, including the world's largest potash mine shaft project at our Esterhazy location in east central Saskatchewan.

In less than a decade, Mosaic will have invested more than $6 billion into Canadian expansion. We own assets through the full spectrum of the value chain. We take minerals from raw ore right to the finished product and deliver them to our customers in over 40 different countries.

Canada, as you may know, is the world's largest producer of potash, with over 30% of global supply. Farmers around the globe depend on our products to help nourish crops. They need to grow more food on every acre of farmland.

Mosaic has developed a number of premium products that increase crop yields and combat nutrient deficiency, while using the same amount or less of our products. These products are highly sought after by customers in Asia, South America and across North America.

Our mission as a company is to ensure global food security by helping the world grow the food it needs. The UN estimates that the world population will climb to nine billion by 2050. The world's farmers must produce more food and fuel, and will need more fertilizers to do it. In fact, fertilizers are currently responsible for producing a half of the world's crop yields.

The last several years in particular have been characterized by challenging conditions in agricultural and broader commodities markets. Adding to those challenges are the difficulties we've seen with rail transportation across Canada this year. Potash is Canada's largest mineral export, both by volume and in economic terms, so a reliable, safe rail transport system is absolutely critical to ensuring that exports can not only continue, but continue to grow. As it stands, 95% of Mosaic's potash is exported from Canada each year, almost half of which is shipped to offshore customers through Canpotex, the international marketing agency.

In a challenging economic climate, innovation is more important than ever as an ingredient to success. In recent years, we have conducted more than 1,000 product trials with highly regarded private researchers and universities, as well as customers and growers. Mosaic's innovation pipeline encourages bottom-up idea generation from within our workforce. On an annual basis, Mosaic spends about $11 million on continuous improvement, research and development, and new technology development.

Our Canadian R and D team evaluates ideas and advances the most suitable ones for further development. This process has created several major successes. I have a couple of examples.

Our Aspire premium product combines potash with boron, the world's second most deficient crop nutrient, allowing growers to save energy, time and money by applying both nutrients at once. Aspire has a slower release time, allowing less leaching and runoff. It was created by Mosaic and is now marketed globally and exported from our mine in Colonsay, Saskatchewan.

On the automation side, Mosaic has several automation projects using our in-house engineers and other specialists. These projects are aimed at increasing mining efficiencies, sustainability and safety. Though the automation project is in its pilot stage, we see it as a potential game-changer in the coming years.

Mosaic fully supports the continuation of the scientific research and experimental development, or SR and ED, tax credit for mining, as this program can make a significant impact on Canadian R and D investment decisions. However, we believe there is a need to review the current application process. We have experienced a process that is cumbersome and difficult to navigate. It potentially dissuades Canadian companies from further investment in Canadian R and D. A more efficient, streamlined process would benefit and grow the Canadian economy.

● (0900)

Before I close, I'd like to talk about environmental matters for a brief moment. Recent research conducted by a third party on behalf of Mosaic shows that Canadian potash producers are best in class in terms of greenhouse gas emission intensity around the world. In 2014, Canada's full life-cycle GHG emission intensity for potash was only 29% of the global average, and significantly lower than other major potash regions.

At the same time, we face taxation rates and shipping costs that are far higher than our main competitors', specifically Russia and Belarus, which negatively impacts Canada's competitiveness. We would encourage the government to think holistically when considering agriculture and Canadian exports, and to bear in mind the cumulative impact of current and proposed regulations. Right now, there are several major initiatives under way, including carbon pricing, the impact assessment review and regulations, and the clean fuel standards. These must not be viewed in silos, as the cumulative impacts of federal regulations could discourage global companies from continuing to make investments in innovation for the betterment of both the environment and the economy. In fact, some recent studies show that the rate of investment in Canada has already slowed considerably in the last several years.

We would recommend that the government earmark funding to establish an energy efficiency program that would assist with upfront capital costs for new projects and for retrofits of existing operations. These types of investments would help support mature energy-intensive and trade-exposed sectors such as ours as we work to access remaining emission reduction opportunities and increase competitiveness.

We would be pleased to continue the conversation with you at any time, and I am happy to answer any questions you may have.

Thank you.

**The Chair:** Thank you, Mr. Hopson. I just hope that's not your back window that we see there, with all the snow. That's a bit early for us.

I also want to welcome all the staff, the translators, and the technical guys, who make our work so much easier, and also the media. Thank you for being here.

We'll start our question round with six minutes each.

We'll start with Monsieur Berthold.

[*Translation*]

**Mr. Luc Berthold (Mégantic—L'Érable, CPC):** Thank you, Mr. Chair.

I hope that, like us, you had a great summer. We have indeed visited many farms. It was a pleasure to meet farmers all over Quebec and even sometimes elsewhere. I think the challenges are very real for everyone. The summer was a little dry in some areas, and we should spare a thought for those farmers today, since there are many questions about what will happen in the coming days.

Without further delay, I will ask Mr. Hopson a question.

At the end of your presentation, you talked about the carbon tax. I have noticed that, in recent years, Canadian companies have made a major effort to reduce their carbon emissions. I think you mentioned that your company is one of the most effective in reducing greenhouse gas emissions.

Am I mistaken in saying that every time a company like yours invests in Canada, we are concerned about reducing emissions and doing everything we can to ensure that, environmentally speaking, all the current climate change conditions are met?

[*English*]

**Mr. Tyler Hopson:** I'm not sure if I fully understood the question, but certainly we have made efforts over the last number of years and even decades to improve our environmental performance. As a company, we have set some internal targets—and that's global, as well as across Canada—to reduce our emissions by 10% per product tonne by the year 2020. As far as greenhouse gas emissions go, we've already achieved a 5% reduction, with more to come, as well as reductions in energy and freshwater use.

However, as I said in my remarks, when you compare Canadian potash production to some of our global competitors, we already come out quite favourably. In fact, some estimates are that the emissions we create are 50% less than those of other companies and other countries around the world. It's challenging for us to continue to see those major reductions in emissions. There are some opportunities, but for a mature sector that is energy-intensive, those types of further reductions would require significant research and upfront capital, which of course is a challenge for us.

● (0905)

[*Translation*]

**Mr. Luc Berthold:** Congratulations. You have done all that and you have achieved those results without anyone having to force your hand with a carbon tax. Let me emphasize that Canadian companies are proactive. They do not need to be penalized by imposing taxes and making them less competitive on the international scene. All we have to do is encourage initiatives like the ones you have mentioned, Mr. Hopson.

I will now turn to the representatives from Colleges and Institutes Canada.

I have had the opportunity to travel a great deal. You mentioned the workforce issue. Now, all the programs, whatever they are, are desperately trying to attract young people, students.

How do you get them interested in agriculture?

**Ms. Christine Trauttmansdorff:** That's a good question. We are concerned about this in our sector.

[*English*]

I think it's something that is not limited to the agriculture sector. It's about helping young people—as well as older people, because, more and more, education is becoming lifelong—understand what colleges and institutes offer and understand the job market better—what training they're going to need and what opportunities are open to them in the future—and then turning those into something that's fairly real and tangible and is going to attract them.

I think the opportunities that work-integrated learning provides are a tremendous way to attract people. If people have an opportunity, either before they start their studies or during their studies early on, to work in a company, to see what is involved in that industry and understand what the options are, because there are many career paths, this is a tremendous way to help people see the potential for their future careers.

[*Translation*]

**Mr. Luc Berthold:** When you talk about innovation, new technologies, young people don't automatically think about agriculture. However, during my trips this summer, I noticed that there is tremendous development potential. Your Smart Farm Project is truly very interesting.

Isn't showing young people that today's agriculture is not the same like farms used to be encouraging them to discover agriculture as a fine occupation?

Mr. Cullum, what do you think?

[*English*]

**Mr. Stuart Cullum:** I agree with you. What's exciting about the smart farm is that it was developed in collaboration with industry. We were very deliberate in engaging with industry to help us understand this kind of learning environment, because that's really what we've created, and that is needed in order to equip the future workforce.

What that does, then, is provide assurance to anyone looking at our college as a place to come in order to get a job. Each of our programs has an industry advisory committee that helps us ensure that both our academic programming and our learning environments are well positioned in order to ensure that the students coming out, the graduates, are going to be job-ready. That's exciting for our students and really provides them with assurance.

As well, the smart farm itself is highly—

**The Chair:** I'm sorry, Mr. Cullum, I'm going to cut you off.

**Mr. Stuart Cullum:** Oh, sure, absolutely. Thanks.

**The Chair:** Thank you.

[*Translation*]

Thank you, Mr. Berthold.

[*English*]

Mr. Longfield, you have six minutes.

● (0910)

**Mr. Lloyd Longfield (Guelph, Lib.):** Thank you, Mr. Chair, and welcome back to everyone in the room.

I also visited some farms over the summer. We had an all-party visit to the Syngenta research centre just north of Guelph. I went to a national farm trust. It's very interesting to see the urban and rural connections there. I also visited an organic farm and saw some of the challenges around the drought that we were seeing in southern Ontario and what they were doing to combat that using labour from other countries. Part of that fits into the discussion this morning in terms of how we can become more competitive.

I'm really interested in the connections with colleges. As I've said in other meetings, I come from Red River College in Winnipeg. I know the connection between manufacturing and agriculture, and I want to start with that.

In your presentation, you mentioned work-integrated learning and the programs around upskilling, and how important they are to creating opportunities for people mid-career to keep up with what's going on as we get into digital technologies. Could you maybe comment on how the federal government could help or is helping with developing programs to upskill the workforce?

**Ms. Christine Trauttmansdorff:** This area is really emerging as perhaps the next wave of priority. Dominic Barton highlighted in his reports the need to become what he called a "learning nation", that lifelong learning. I think that is going to be a huge opportunity for colleges to build on the deep connections they have with their communities and their economic development, with players in their regions, and most importantly, with companies and industries that have those needs and see them.

It's great to talk about recruiting new graduates, new employees with all the right skills, but first of all, you can't recruit all the time, and second of all, those skills requirements are going to change over time. By having that conversation about how to develop the skills and keep the current workforce up to speed, there is an opportunity to build some really strong partnerships with post-secondary institutions generally, and particularly with colleges, which are very flexible and responsive and can put together small, short, tailored programs to keep people current.

**Mr. Lloyd Longfield:** So there really is a distinction between temporary foreign worker programs and programs to upskill that workforce.

**Ms. Christine Trauttmansdorff:** Absolutely.

**Mr. Lloyd Longfield:** That's good, because sometimes that distinction isn't made in the marketplace.

With my very limited amount of time, I want to reach out to Regina and thank you for joining us.

I've spent a lot of time in the potash mines in Saskatchewan. You mentioned some of them, the work going back to Kalium days—that's how old I am—and now what Mosaic is doing.

The price on pollution is something that our government is quite focused on. As we're working internationally to develop our export markets, showing a responsible approach to climate change—pollution isn't free—we also have to give credit to companies that are reducing their carbon footprints. Have you been able to take advantage of any of the carbon reduction programs we have in terms of greening infrastructure? Have you been made aware of those, or could we help with that? Is that something we need to expand more as we do this study?

**Mr. Tyler Hopson:** We've certainly looked at a variety of programs in recent years and definitely tried to find a fit where possible for suitable programs. To be honest, thus far we've struggled somewhat to find that right fit. Some of that may be us not having a full awareness of what's out there, or we've found that the funding available is either too large or too small in some cases for the types of projects we're working on.

We are keeping an eye on it, and we have been in some talks with Innovation, Science and Economic Development Canada to look at what the options may be. It's definitely something we are interested in pursuing.

**Mr. Lloyd Longfield:** In terms of our study, maybe something we can suggest is promoting the programs we have through Environment and Climate Change, the green infrastructure programs. I know that the mining industry has always been a leader in reducing footprints and environmental impacts, and, again, it doesn't get credit for that.

In terms of your efforts, you're talking about runoff reductions, about competing against other countries, such as Russia, which is one of our largest competitors in the potash industry.

Are there other markets we could be developing and focusing on in terms of fertilizer production in Canada?

**Mr. Tyler Hopson:** As far as export is concerned, or...?

● (0915)

**Mr. Lloyd Longfield:** Yes. You said that 95% of our product is being exported.

**Mr. Tyler Hopson:** That's right.

**Mr. Lloyd Longfield:** I know we are competing against Russia, typically.

**Mr. Tyler Hopson:** Certainly there are a variety of potash-producing regions, but Russia and Belarus are the next largest ones after Canada. We have found it a challenge to keep our business costs, our production costs at a rate where we're still competitive, given the significant differences among the various environments we operate in. We've even seen cases where Russian and Belarusian producers are able to ship more cheaply, more affordably than Canadian producers, even into North America.

**Mr. Lloyd Longfield:** That's been going on for many years. I know we have stockpiles when markets are bad, and we have mountains of potash on the prairies that we don't need on the prairies.

It looks like I'm out of time, but thank you very much for joining us. I'm sorry you couldn't join us earlier in the study. Your testimony was very helpful. Thank you.

**The Chair:** Thank you, Mr. Longfield.

Now we have Mr. MacGregor, for six minutes.

**Mr. Alistair MacGregor (Cowichan—Malahat—Langford, NDP):** Thank you, Chair.

I'll extend a welcome to all my colleagues. It's good to see everyone again.

I'll start with Colleges and Institutes Canada.

Arguably, the defining issue of the century is going to be climate change and our response to it. We have several paths open to us, which are going to lead to very different outcomes.

I know from a previous study that farmers are often on the front lines of climate change. They are the ones who are probably our best stewards of the land, but they suffer the most from weather patterns that are not the same: droughts, floods and so on.

In the context of our technology and innovation study, and the work going on at your various colleges and institutes across the country, are there any particular spots you can point us to where you're training students on how to adapt and mitigate? Are there any particular technologies you can underline that are going to help us meet this challenge?

**Ms. Christine Trauttmansdorff:** Maybe I'll respond to that with a general statement and then a specific example.

In general, the whole college system is designed to be responsive to the current needs of local industry. We do that through deep connections to those industries, particularly through program advisory committees. Twice a year, the people who are putting together the program meet with a group of people who work in the industry, who are employers in the sector, to ask what kind of curriculum they need, what they are looking for in their graduates, how the graduates they sent last year are working out, what their anticipated forthcoming labour market needs are, and, particularly in terms of technology or new demands on the industry, what they need to build in. That characterizes the whole college system.

I'll give you a specific example, coming back to the applied research work that we're talking about in particular today. In New Brunswick, at the Collège communautaire du Nouveau-Brunswick, there is a research project that is helping farmers and producers do environmental assessments on how they can use the soil, the water, the resources, and the fertilizer more efficiently in order to mitigate the environmental footprint, as well as to work more effectively and deal with some of the situations that you are describing in terms of drought and unpredictable weather patterns.

**Mr. Alistair MacGregor:** Mr. Cullum, can you add anything from Olds College?

**Mr. Stuart Cullum:** I think there is a great leadership example in Canada of how we are continually producing more while reducing the effects on the environment. The whole concept of smart agriculture is the use of technology and science to increase economic and environmental sustainability. They do go hand in hand. I think our agriculture sector has demonstrated that track record for years and decades.

We are positioning Olds College to be a leader in smart agriculture. Our smart farm is intended to focus on the application of technology to increase the trend toward increased productivity and sustainability, and lessening the impact on the environment. Within our Technology Access Centre on livestock, that tack is specifically set up to help producers produce more efficiently, essentially increasing weight gains in their cattle while decreasing the amount of feed and water utilized to do that. We are addressing it through genetics, but also through technology. We are supporting companies in the introduction of technology in order to enhance that. We are also working closely with our university partners on greenhouse gas emission reduction in our cattle herds.

There are a lot of great examples of how our industry is leading and how our colleges are helping companies leverage technology in order to increasingly lead in this space.

● (0920)

**Mr. Alistair MacGregor:** Thank you.

Mr. Hopson, I'll continue along the same vein with you.

I think you very clearly laid out the challenges your industry has. It's a fairly energy-intensive area, but still one of Canada's strongest exports and one of the greatest economic engines we have. I know that our main competitors, Belarus and Russia, certainly don't have the same kind of standards we do. I think this is definitely a conversation that we need to continue having with your industry, on how we can best support it.

I'm interested in hearing something from you. Worldwide, there is a growing consumer consciousness of how our products are developed. Increasingly, people are concerned about how they are developed, and what kind of standards are put into place. Do you think there would be any value to your industry, to worldwide customers, in showing that Canadian potash was developed with certain standards in place and that we, by far, can outrank Russia and Belarus in these areas? Is it worth pursuing that kind of marketing strategy going forward?

**Mr. Tyler Hopson:** I think that's certainly a story that we should tell, and we should make others aware of our track record and the successes that we have, not just on environmental performance but also certainly when we look at other factors in the marketplace or in business around labour standards and community investment and engagement. I think Canada has a lot to be proud of on that front, and certainly we should make people aware.

As it stands today, I wouldn't say we are rewarded for those aspects, as far as the price that we're able to get on the international market goes. It is a global, competitive marketplace, so we take the price we're able to get. Unfortunately, today, I wouldn't say that those other factors you talked about are factored into the price of potash on the international market. That could change, and probably will change, as you pointed out, but as things stand, it's not something we're necessarily rewarded for.

**Mr. Alistair MacGregor:** Thank you.

**The Chair:** Now we have Mr. Jean-Claude Poissant for six minutes.

[*Translation*]

**Mr. Jean-Claude Poissant (La Prairie, Lib.):** Welcome to the committee, everyone.

My first questions are about education and the workforce.

Last summer, I visited farms, but I also replaced my son on the farm. I hadn't done so in three years. I saw the new technology being used now there, and it's taken me a long time to learn how to use it. That's why I'm asking a lot of questions about the new technologies, which are rapidly changing. How will they evolve over time? Are our young people able to keep up with this very rapid evolution?

**Ms. Christine Trauttmansdorff:** That is a good question. I will say more or less the same thing I said in response to one of Mr. MacGregor's questions. What matters is how we train people. What matters is not so much the details they are learning during their studies, but how they learn.

[*English*]

If young people are exposed to problem-solving and challenged to look at problems in an innovative way, to work in the workplace, and to understand how small-business people, farmers, or producers are tackling the problems, their way of learning becomes different. I think that's probably the thing that we need to focus on most—not learning the specifics of a technology but how to think in a creative, innovative way. We're very focused on that.

That said, there is a huge demand to learn about new technologies, so the equipment, the facilities, and the faculty we employ in the colleges are hugely important. At a minimum, we need to be training people on the technology that is present in the industry today—and hopefully we're a step ahead, so that the graduates are importing new ideas, new technology and new skills into the workplace, providing leadership for the existing workforce, and showing them some of the new things that can be done. That requires a constant investment in the infrastructure that post-secondary institutions enjoy. It isn't cheap to keep up with technology, but I think that if we don't do that, we're failing our young people.

● (0925)

**Mr. Stuart Cullum:** I'd like to speak to that quickly as well, because I think it's really important that we recognize the convergence of technology and agriculture. In fact, at Olds College we've just launched a new school in agriculture technology. We've just hired a new dean, and we will be developing a new degree in this space. We expect that we're going to attract faculty from technology sectors in order to address this.

Many of the partners we are now working with in our applied research are not agriculture companies; they're technology companies. They come to us for two reasons. First, they see their technology, which is applied in one industry, as being very applicable to agriculture. Second, they don't understand agriculture, so they come to institutions like ours because they want an access point to agriculture. We're creating learning environments through our campuses to support our students in addressing new technology. Ultimately, our intent at Olds College is to provide a learning environment that represents the future of agriculture.

[*Translation*]

**Mr. Jean-Claude Poissant:** Thank you.

That brings me to my next question.

What percentage of young people who don't come from farms enrol in a course? Is there a follow-up to see whether people from the farming community are doing better than those who did not come from agriculture?

**Ms. Christine Trauttmansdorff:** I don't have those numbers, but I will follow up to answer your question.

**Mr. Jean-Claude Poissant:** Okay.

My next question is for Mr. Hopson. We talked about the fertilizers spread on lands across the country. Do you have any idea how much land is covered by organic fertilizers? I know there could be more, but do you have any idea of what that might mean?

[*English*]

**Mr. Tyler Hopson:** That's not something I have at hand right now, but if you're interested, we could certainly look into that, find out some numbers on that front, and follow up.

[*Translation*]

**Mr. Jean-Claude Poissant:** Thank you. We would be grateful.

I would like to go back to the training. As you know, there's a labour shortage in agriculture. I have previously participated in the workplace apprenticeship program. Have you heard of this program? If so, what do you think?

**Ms. Christine Trauttmansdorff:** As we said earlier, it is very important to maintain the skills of the current workforce in addition to training the people who are coming into the industry.

[*English*]

I think the partnership with industries and companies, to have a conversation and help companies and industries understand what technology is emerging and what the future workforce is going to need and to then develop training—to either access the training that is already available or to tailor-make it so that it can be delivered to employees in the workplace—is an area of tremendous opportunity.

[*Translation*]

**Mr. Jean-Claude Poissant:** In closing, I would like to know whether you see a difference in how many of the next generation of young people enrol in supply management production and those who choose another program?

Are more of them opting for the training on supply management production or is the number relatively balanced?

**The Chair:** Please be brief.

[*English*]

**Ms. Christine Trauttmansdorff:** I'll come back to you on that question. I'll have to give it a little bit of thought.

[*Translation*]

**The Chair:** Thank you, Mr. Poissant.

I will now give the floor to Mr. Drouin for six minutes.

**Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.):** Thank you very much, Mr. Chair.

It's my turn to welcome everyone who's here today. I look forward to working with you this fall.

[*English*]

Christine or Stuart, maybe you could enlighten me on the access to technology. We talk about training for technology, but there's also access to technology in building that entrepreneurial spirit in Canada. One of the things the government has highlighted is adding more value to our agricultural products. Rather than just exporting raw materials, we're actually processing them in Canada.

One of the centres in Ontario is the Ontario Agri-Food Venture Centre in Colborne. I visited it a couple of weeks ago, and I found it amazing to see the access to technology provided to farmers who come in. They gave one example of a farmer who walked in with sweet potatoes and said, "Help me do something with this." However, all of the equipment they have inside is quite expensive. How do we help those people? With those small entrepreneurs, what would be the role of the college to help them scale up and potentially build more agri-food venture centres in Canada?

● (0930)

**Mr. Stuart Cullum:** This is a key question. It's actually a space that colleges are really well positioned to address.

We have a lot of land at Olds College. When I look at our farm, I see a current-state operation. We want to transition that into the future of agriculture and bring new technology in. We'll only do it through partnerships. We do not have the resources to purchase or acquire that technology. For the smart farm, we had to work with 15 partners, agriculture and technology partners, some multinational, to get the technology in place.

That allows our producers to see where the sector is going. It also allows technology companies to come and develop, scale, and demonstrate their technology, which will ultimately end up in the field three or five or 10 years down the road.

In a couple of weeks, I'll be heading to Australia. I'll be talking to an automation company in Australia, which has a technology that isn't in North America. They're looking at Olds College as a potential place to introduce that technology as a way to demonstrate what they hope will be applied in our agriculture system. For the farmers, that's great, because they need to see technology work before they're willing to invest in it on their own farm.

As an institution, we want to be a support for those companies to introduce it, as well as a support for farmers who are looking to get that technology onto their farms and validated.

**Ms. Christine Trauttmansdorff:** I can tell you about similar facilities. Holland College has a research centre that is focused very much on what you're describing. They're focused particularly on the food industry, but they're doing market testing and taste testing on the look and feel of products in order to enhance them for the marketplace.

George Brown College in Toronto is another very food-focused centre that's helping small businesses develop new product lines. Lambton College in Sarnia is focused on the sugar beet industry. It's a growth area. What can we do with those crops? How can we increase the efficiency of the production? How do you explore new markets for those products that—

**Mr. Francis Drouin:** Is that something that Colleges and Institutes Canada is tracking, in terms of what colleges are doing in different spaces so that we don't necessarily replicate what one college is doing versus the other but we provide added value to the college system in Canada?

**Ms. Christine Trauttmansdorff:** That's an ongoing challenge.

**Mr. Francis Drouin:** Yes.

**Ms. Christine Trauttmansdorff:** Things move quickly, and colleges move quickly. They're bringing on new projects. We've tried showcases and databases of projects, and you can't possibly keep up with it. If something is happening, it's going to be happening in a college. We can fill you up with stories and examples of anything you're looking for.

**Mr. Francis Drouin:** I don't know how much time I have, but I have maybe one last question on access to workers and whatnot. We know that when we talk about technology, automation is sort of fixing the problem of access to workers. How is the college system attracting youth in agriculture? Are you seeing a trend developing there?

**Mr. Stuart Cullum:** Actually, it's becoming easier because our industry is becoming so technology-focused. We're able to attract a lot of young people into this industry who aren't from the farm, which is important, because they see it as a place where they can be an IT expert, a business systems expert, or an artificial intelligence expert. It's not just about agriculture anymore. It's about how they apply that passion in a sector that is going to be a future economic generator for our country.

**Mr. Francis Drouin:** I guess I do have more time. In terms of IP, when you're working with companies, how is that system built with the colleges? Do you retain certain...?

**Mr. Stuart Cullum:** It's very friendly. For most of the colleges—actually, I think for all of the colleges—in their applied research apparatus, the intellectual property flows to the companies. We're interested in providing a service to industry and also in engaging students as part of that learning exercise, but the intellectual property flows to the company. That's a really important principle on which we've always built our applied research activities: the free flow of IP.

**Ms. Christine Trauttmansdorff:** The other thing we're very cognizant of is that a lot of the industry partners that come to a college don't have as much information about IP and don't understand the IP regime and what's available to them, so colleges become a bit of an access point for "Who do I go to and where do I do it?" When you're a start-up or a small company this may not be the thing that you're preoccupied with at first, but it's crucial to have that knowledge or access to information about IP management. That's one of the functions that a college research office can provide.

● (0935)

**Mr. Francis Drouin:** That's great. *Merci.*

**The Chair:** Thank you, Mr. Drouin.

Mr. Dreeshen, you have six minutes.

**Mr. Earl Dreeshen (Red Deer—Mountain View, CPC):** Thank you very much, Mr. Chair.

It's certainly great to be back here. I was looking at the picture that Mr. Hopson has there. That would be my riding right now, with the snow.

I'm certainly glad to have everyone here in this discussion. The key thing is, how do we change? How do we make sure that our agricultural industry is ready for our Canadian exports? That's the critical part.

Mr. Hopson, you spoke of some of the concerns and issues we have there. Of course, one of the things the government can do is make sure that our transportation system is working. This is an issue, whether it be grain transportation or commodities, such as the potash that you're trying to move, and of course we see our rail lined up with oil tankers. These are some of the concerns we have, and they really have to be thought about.

I'd like to address my discussion to you, Mr. Cullum. Thank you for being here. Olds College has a hundred years-plus of history, and it has truly been important. It has gone throughout the world, as people who have come to Olds College understand just how important it is.

I'm wondering if in this day of big iron and big data.... I mean, these are the critical things that are taking place right now. Twenty miles from Olds College, you can't complete a cellphone call, but we do know how important it is to be able to get all this information so that all of these data points can be analyzed.

I know that Olds College has the Centre for Innovation. There are a lot of things being done there. I wonder if you can tell us how the smart farm, where we've brought in all of these different companies to help, ties into the other projects, such as your Centre for Innovation.

**Mr. Stuart Cullum:** It's a good question. Ultimately, Olds College has been in the applied research and innovation game for around 20 years, and it's focused on the needs of industry. We really want to ensure that we are developing centres that can be a foundation for industries to come and develop their products, validate the scale and demonstrate them.

It also provides a tremendous learning environment for our students. The smart farm is an extension of that. It's about ensuring that those environments are world class and, as I mentioned, represent the future of where agriculture is going. It really does connect to that.

The point you mentioned about connectivity is really important. The smart farm needed to be developed in such a way that all the critical infrastructure technology was there, including connectivity. It's really cool. If you come to the smart farm, which is a field in the middle of our agricultural lands, you have full Wi-Fi connectivity. That's critically important, because you can create all the data you want within the various devices and monitoring and sensoring equipment, but if you can't connect to the devices, if you can't connect to your smart phone, you can't do anything with it.

Rural connectivity is a key challenge, and it's something we're working on in partnership with many companies. We're developing a great relationship with many of the telecoms in terms of how we can create wireless meshes and ensure that connectivity is enabled, along with the technology that's in the field.

**Mr. Earl Dreeshen:** With the big data and big iron, of course, you would have a lot of equipment companies as well that would want to make sure they tie into this new technology, and they're bringing with them, as was mentioned, an entirely different type of workforce. People have this idea that there are certain kinds of people who work on a farm. That's completely not true. You need to have high-tech individuals who are safety-conscious and who understand how all of this multi-million dollar equipment works. I think that's a critical part as well.

Is there any discussion you could have on how the relationships between companies and the college are working out?

Then I'd like to give the last moment or so of my time to Mr. Godin.

**Mr. Stuart Cullum:** Yes. I talked about the development of a new program stream, a new school in agriculture technology. That's a response to industry asking us as a college to address this issue of technology and agriculture. Many of the folks around the table represented big iron, those companies. They are hiring people and need to train them themselves, and that's a challenge. It's important that, as an educational institution, we respond to that challenge and produce the skills and competencies needed so they have the talent required in order to support their companies and the customers they serve. I agree with you that it is an entirely different workforce that's emerging.

It's also important that we understand that there are a lot of folks within the sector already who are past the typical post-secondary stage and need reskilling. With our education programs, we are ensuring that we're developing programming so that producers and other folks within this industry can come back into our learning environments, into our smart farm, and get the skills they need in a rapidly changing workspace.

● (0940)

**The Chair:** There are a couple of seconds for Mr. Godin.

[*Translation*]

**Mr. Joël Godin (Portneuf—Jacques-Cartier, CPC):** Thank you very much, Mr. Chair.

Agriculture is a major sector for my constituents in the riding of Portneuf—Jacques-Cartier, where there are a lot of farmers.

Mr. Cullum, I want to validate what you said, to make sure I understood correctly. In your opening presentation, you said that the agriculture supercluster had not been a success. Is that what you said?

[*English*]

**Mr. Stuart Cullum:** There were two agriculture supercluster proposals in the final round. One was successful; one was not.

[*Translation*]

**The Chair:** My thanks to the panel of witnesses.

[*English*]

Thanks, Mr. Cullum and Christine, and also Mr. Tyler Hopson from Mosaic, for being here today. It was a very informative discussion.

We'll suspend and continue in a couple of minutes with the other group.

● (0940)

(Pause)

● (0945)

**The Chair:** We'll get going. I hear that there might be a vote happening soon. We'll try to get all we can in the time we have.

I want to welcome, by video conference for our second hour, Ms. Leanne Fischbuch, executive director for the Alberta Pulse Growers Commission. I hope I pronounced your last name correctly.

Also, from Niagara College, we have Dr. Michael Duncan, Natural Sciences and Engineering Research Council industrial research chair for colleges in precision agriculture and environmental technologies; Sarah Lepp, senior research associate for research and innovation; and Gregor MacLean, research project manager for research and innovation.

Welcome to all of you.

We'll start with opening statements of seven minutes. If you want to start, Mr. MacLean, go ahead.

● (0950)

**Mr. Gregor MacLean (Research Project Manager, Research and Innovation, Niagara College):** I'd like to thank the Standing Committee on Agriculture and Agri-Food for having us here today. We represent Niagara College, and specifically the Agriculture and Environmental Technologies Innovation Centre. On my right, we have Dr. Michael Duncan, Natural Science and Engineering Research Council of Canada's industrial research chair for precision agriculture and environmental technologies. We also have Sarah Lepp, senior research associate. I'm Gregor MacLean, project manager.

What's great about working at Niagara College is, of course, the fact that we have excellent infrastructure, staff, faculty, students and graduates who support and execute our work. Sarah and I are two of the graduates. What's great is that, despite the fact that we're based in Niagara, in southern Ontario, we work with Canadian companies and have impacts across the country, and our partner companies have impacts across the world.

As a refresher, I think all of you know, but it's important to start by indicating that modern farms are businesses. They need to generate revenue, and with that revenue they also need to make a profit. More and more, to do that in a very competitive commodity market, they need to use the data and technology available to them and, in a lot of cases, that's captured under one banner called precision agriculture, smart agriculture, as Stuart was talking about. That's the area we work within, precision agriculture.

We do three things: We build software, whether that's phone applications, web applications or desktop applications; we work with hardware, moving and automated robotics, drones or UAVs, as well as installed environmental sensors; and we work with data, whether that's processing or analytics, turning all that information into wisdom, information that could help farmers make better decisions in their farm businesses.

Ultimately, we are doing work in three primary crop areas: hazelnuts; grains, which are corn, soybeans, and wheat; as well as vineyards, grapes. Those are not the only things we're willing to work on, but that's what we've been doing for the past number of years. We're willing to expand as well.

I'll just go over a couple of project examples to help folks understand what we can do and the type of work we do. First, one primary collaborator right now is Ferrero. You might recognize them as one of the world's largest confectionary companies. They make the delicious Nutella, the chocolate hazelnut spread, and Ferrero Rocher, the delicious hazelnut chocolates.

As you can imagine, they buy a lot of hazelnuts. They're the world's number one hazelnut buyer, and the bulk of those hazelnuts come from the country of Turkey. You can imagine that, if Turkey has environmental, economic or any sorts of issues, those could affect Ferrero's supply. Well, it's a really great thing that Ferrero also has a plant that employs over 1,000 people in Brantford, Ontario. With that plant's strategic location, they're looking to see 20,000 acres of hazelnuts planted in Ontario in the next 10 years.

We're collaborating to support that work in two ways. There are long-term historic climate and future climate modelling studies that we're building into proprietary software we're creating with our programming team members for Ferrero. They'll provide that to their clients and their potential farmers for a new high-value crop for Ontario farmers that could be worth anywhere from four to ten times the current cash crop revenues. Also, the export opportunity is a new high-value crop, raw, going outside of Canada. More importantly, it's a value-added crop going throughout North America and Australia that comes from Brantford.

The second project I'll discuss is a great example of our working directly with a farmer. At Yellow Gold Farms, Rick Willemse, who is in Parkhill, Ontario, outside of London, farms over 1,000 acres of cash crops: corn, soybeans and wheat. A number of years ago, he created a very innovative precision agriculture variable rate algorithm and process. People wanted to buy it from him to use it. The problem is, he is a very busy person. He's always needed, and he doesn't have the time to do that work. If he provided the spreadsheets, as you can imagine, somebody would steal his secret algorithm. With our data and software expertise, we built that algorithm into web software for him so that he's able to commercialize it as an export software product or as a domestic software product, giving him a diverse income to his farm operation.

The final project I'll discuss is with a company called SoilOptix. They are out of Tavistock, in western Ontario. They offer a proprietary soil health technology. They drive over a field to collect soil health data, and after that's been done, they take seven to eight hours to process the data. Whether the field is 10 acres or 100 acres, it takes seven to eight hours. As you can imagine, that's a bit of a long time.

● (0955)

We've collaborated with them over the past 10 months. We've cut that time down to 30 to 90 minutes, which is 60% to 90%. The high-valued and high-skilled jobs to process that data are still happening in Tavistock, Ontario, not to mention that their hardware and service technology is being exported around the world: China, Argentina, Brazil, the United States, as well as across Canada. We're helping them to scale that technology while maintaining the jobs in Ontario, and we've seen the workforce double in the last year as well.

You see that the work we do helps farm profitability. It helps them be efficient with their resources, including fertilizers, as well as how they spend their dollars and understand the ROI provided based on technology. Ultimately, it has improved sustainability and business practices to help the farmers make better decisions, whether it be about soil or weather impacts.

This work would not be possible without our funders at the federal level, the Natural Sciences and Engineering Research Council, and our excellent contacts Marie and Marion. At the provincial level, there is the Ontario Centres of Excellence and Padraic, Richard and Alexandra. And of course there's Colleges and Institutes Canada, the base funding they support us with and the internship funding.

We are excited to discuss any questions you have, as well as potential future directions we have in moving and automated robotics.

Thank you.

**The Chair:** Thank you, Mr. MacLean.

There are about 30 seconds. I don't know if anybody else wanted to interject or if that's okay with the group. We'll have questions anyway.

Now, from the Alberta Pulse Growers Commission, we have Ms. Leanne Fischbuch.

You have seven minutes.

**Ms. Leanne Fischbuch (Executive Director, Alberta Pulse Growers Commission):** Thank you, Mr. Chair.

My name is Leanne Fischbuch. I am the executive director of the Alberta Pulse Growers. Farmers elected to our board represent over 6,000 producers of pulse crops in Alberta. These crops include field pea, dry bean, lentil, chickpea, soybean and faba bean.

Our members support our organization through a refundable levy on the cash sale of pulses. The funds are invested in research, market development, extension and communications to increase the profitability of pulse crops for producers, and to increase the knowledge and acceptance of pulse crops by the consumer.

I am pleased to provide comments to you today on the topic of research and development to encourage Canadian exports. In the interest of time, I'd like to focus on a few of the topics, namely trade, policies and programs, and regulatory frameworks.

Alberta has the second largest number of acres and amount of production of pulse crops in Canada. Within the province, field pea is the predominant crop, followed by lentil, faba bean, dry bean, chickpea and soybean, totalling approximately 2.1 million metric tons of production worth $604 million to Alberta producers in the 2017-18 crop year. In 2016, Alberta exported more yellow peas than any other jurisdiction in the world.

Canada does not consume its pulse production. Canada has been the largest exporter of pulses, at 41% of the marketplace for years. This has been a good news story for the Canadian industry, with growers growing more pulse crops and increasing export opportunities.

Currently, however, the industry is experiencing market access challenges with India, which is traditionally our largest importer. Prior to the slowdown in Canada's largest market, in 2017 the Canadian pulse trade had delivered over 7.1 million metric tons of pulses to over 130 markets across the globe. We recognize that other countries are taking a run at our numbers, and we need to work to make sure we can continue to sustainably grow our production and take it to market.

APG's goal is to have pulses included once every four years in each farmer's rotation in Alberta to obtain a three-million-acre production. In addition, we are working with our national organization Pulse Canada to diversify our market opportunities, which includes broadening opportunities for trade of primary products and supporting inclusion of pulse ingredients in pet and human foods, aquaculture and feed in our 25 by 2025 strategy so that growers have markets for their production.

APG supports the efforts to act on "Unleashing the Growth Potential of Key Sectors"—the Barton report—to increase Canadian agricultural exports from fifth place to second place. We see the need to diversify and expand opportunities with our pulse crops.

Discovery, development and marketing of new products take investment. As a grower organization, we use our funds to address questions and capitalize on bringing solutions to our growers. We cannot do this alone. There is a significant need to collaborate with others who are bringing resources such as funding and people to the table.

APG has participated via Pulse Canada in accessing AgriMarketing program funding, and more recently AgriScience cluster funding. APG committed to providing nearly $2.3 million in matching to the $11.1 million in pulse science cluster support from the federal government, which allows our industry to tackle priority research that growers would not be able to fund on their own.

The recent announcement of the success of the Protein Industries Canada supercluster application is also encouraging, and APG is waiting to learn how that funding will be implemented and how we can match our objectives. It's critical to have programs pairing industry investment with public investment and allowing industry to address issues that form a foundation to build upon to meet global and domestic opportunities.

While research addresses problems that are holding the industry back, there are many other areas that impact the ability to grow pulses and reach out to capture export opportunities. There are regulatory challenges that can reduce the potential success of the industry to reach both export and domestic value-added opportunities. These include the following.

First, with respect to transportation, Canada's reputation as a leader in global exports is easily compromised when product is unable to move to market. Systemic rail transportation failure has eroded Canada's brand and trust from international customers of our agricultural commodities. If export opportunities are to be part of the path forward for growth, then transportation needs to be a priority.

Second, the Pest Management Regulatory Agency is challenged with resource shortcomings, such as people and funding, and needs to have its processes reviewed. APG recognizes the importance of the PMRA and its role; however, the agency also has the potential to limit expansion of the pulse industry and significantly affect its future.

● (1000)

Third, it should be a priority for the Canadian Food Inspection Agency to be a global leader in exports, recognition of scientific standards and global harmonization. The codex for maximum residue limits or continued efforts on low-level presence detection can be a challenge with the potential to lead to market access issues. If global export is a key opportunity for expansion, APG would support the CFIA's prioritizing work in this area.

Finally, environment and climate change legislation has an impact on growth and opportunity for the agriculture sector. APG recognizes that farmers who incorporate pulses have a positive influence on the environment, such as reducing the use of synthetic nitrogen and reducing greenhouse gas emissions. Even Agriculture and Agri-food Canada supports pulse crops being added to rotation as part of a beneficial practice to increase carbon in the soil. Farmers are stewards of the land and want to do the best possible management to keep it healthy and viable for future generations. Carbon taxes in a global environment put Canadian exports in an uncompetitive position against others who can supply product at a lower cost due to less regulation. A regulatory impact analysis on the agriculture sector needs to be investigated prior to adopting further legislation.

Canada's agriculture future continues to be export-focused. For the pulse industry, our small national population will never be able to eat its way through Canada's production of pulses. That said, Canadians do need to increase their consumption of this healthy and nutritious product for the many benefits pulses provide. However, export will continue to be the primary objective, with domestic value-added production secondary, in order to consume the tonnage that is being produced.

Alberta's pulse farmers see value in the research supporting innovation and opportunities that will ensure they are able to maximize yield, deal with agronomic issues and produce a consumable product while continuing to keep the health of their land in the best shape possible for the future and supplying an export-ready product to the global marketplace.

Acceleration in trade, continued investment in research, and reduction of obstacles to growth such as regulatory challenges are all part of the path forward.

Thank you for your time. I welcome questions.

**The Chair:** Thank you, Ms. Fischbuch.

We'll start our questioning round with Mr. Dreeshen, for six minutes.

**Mr. Earl Dreeshen:** Thank you very much, Mr. Chair.

Thank you to the witnesses for being here today.

First, I would like to talk to the Alberta Pulse Growers about some of the issues Leanne brought up. Of course, our main study is on how technology can support those who are going to be exporting our great products around the world. We have the bulk pulses that we are sending, and it looks as though in the future we should be looking at some refined products as well, doing a little bit of that here.

Perhaps you could let us know a bit about how those two are working together. That would be important.

Again, as someone who has produced pulses in the past, peas primarily, I know there are issues, a major one being what has taken place with India, the tariffs that have been put in. The other aspect is the fumigation situation. We understand, as we look at the temperatures that we have in Canada, why the need for fumigation is different from what other countries importing into India would suggest.

Could you give a bit of an update on where the trade issues are, specifically with India, but also with the confusion that is taking place at the moment with worldwide tariffs, and give us a feel for what is happening there?

● (1005)

**Ms. Leanne Fischbuch:** Thank you, Mr. Dreeshen, for your question.

I'll talk a bit about the first part of your question, on bulk and refined products. When we talk of bulk processing, it's really cleaning the product and then shipping it in large quantities to port and off to the globe. These are the majority of the ways, for example, that peas are moved throughout our system in Canada. For refined products, we would love to see more value-added opportunities created within the Canadian sector. For us, when we look at value-added opportunities, it means fractionation. It means taking the pea, for example, and splitting it into the valuable components, such as protein, starch and fibre.

If we are able to do this type of fractionation eventually, we should be able to attain a higher-value product when we sell into the marketplace. With that type of refined product, if we had the opportunity to attract more companies into the Canadian industry interested in doing this—and it does take money, investment capital and other things, to attract companies—I think we would like to see it.

In Manitoba, we have Roquette coming in—they've broken ground—which is a large processor of fractionated product. We have others that hopefully will be attracted to coming to Canada. My colleague in Saskatchewan is currently in China, and he has had some excellent meetings talking to potential people who are interested in coming and perhaps setting up shop in Canada to do these types of fractionation methods.

For an update on our tariff challenges with our number one importing country, Canadian pulse producers are still subject to tariffs into India. We are under a restriction in terms of the amount of product even going into India. It's a quantitative restriction of 100,000 tonnes of product going in. That has been extended to September 30. At one point—I think it was at the end of August—there was one day when the Indian government lifted the restriction. It caused some excitement in the marketplace, but they immediately closed it down the next day.

The challenge we have with trade with countries like India and how they have treated Canada—and I'm going to say more than Canada, because globally they've inflicted this on many countries they import from—is that they are very unpredictable. This has become a challenge for exporters and farmers.

Initially, in November 2017, when they enacted their tariff on peas, the price dropped for producers by about $2 a bushel. What that equated to for us over the course of the year was an immediate pause for producers to decide what they put into the ground. They dropped their acres this past year. We went from 2.7 million metric tons of production in 2016-17 down to 2.1 million metric tons in 2017-18, and basically took about $300 million away from producers due to that change in access and pricing.

The situation with respect to India now is that we're still under reduced ability to export. We did have an Indian delegation last week with Pulse Canada, and they travelled through Canada to see our supply chain for pulse crops. They visited a farm. They visited a processing facility, and they went out to the port to see the full movement of the product through the marketplace.

While I haven't had an immediate update from Gordon Bacon of Pulse Canada on this, I feel it was really important for the Indian delegation to come out and see how we treat our product, to observe whether we have the problem weeds and things that they consider we have and that's why we would have to fumigate, and then to understand at the ports why we can't—

● (1010)

**The Chair:** Ms. Fischbuch, I'm sorry to interrupt. We're out of time for this one, but I'm sure there will be others who will ask questions.

Thanks, Mr. Dreeshen.

Mr. Breton, you have six minutes.

[*Translation*]

**Mr. Pierre Breton (Shefford, Lib.):** Thank you very much, Mr. Chair.

Of course I'm very pleased to see my colleagues and all the staff today, and to continue to work together for Canada's agricultural industry.

My thanks to the group of witnesses for being here.

My question is for representatives from both groups.

Ms. Fischbuch and Mr. MacLean, in your presentations, you mentioned how important research and development is in the industry. As we know, the goal was $75 billion in exports in the agricultural industry. Innovation in the agricultural and agri-food sector is an indispensable tool in its growth and development.

Could you please take turns, starting with Mr. Maclean, and tell us how important research and development is?

Could you also tell us how the government could be a better partner and contribute to this vector, which is really important and which gives rise to innovation and new technologies, to improve the competitiveness and productivity of our agricultural producers?

**Mr. Gregor MacLean:** Thank you for the question.

I will answer in English. This is what I have to say about research.

[*English*]

In world commodity markets, precision agriculture can make a difference of 5% to 10% cost savings on fertilizer. It can mean a lot of increased yields as well. That's really where the wins are to be found for us. It's important that Canada stay ahead of things by being the first to adopt technology, because ultimately it means savings in the cost of production. That's where we come in, doing the programming of the software and robotics for those cost savings. Ultimately, we have amazing natural capital and great soil and water resources.

As has been noted at events we've attended with people from around the world, we have some of the most advanced farming and agronomic minds. I think the government can continue to support the development of technology for farming, as it does right now.

[*Translation*]

**Mr. Pierre Breton:** Your organization has some eminent experts. That work must be paid for. I also know that the farms that do business with you must fund some of the research and development.

Research and development credits exist in Canada. Is the program well tailored? Could it be improved?

Mr. MacLean, can you tell us how you and your organization see things?

**Mr. Gregor MacLean:** It depends on the organization.

[*English*]

We are funded at the provincial, federal and regional levels. It's up to our partners whether they use the SR and ED credits or not. We do our best to provide the most ROI for the work we do. I don't know the level of adoption. Ultimately, it has been quite good, from our experience. We also work with commodity organizations, such as the Grain Farmers of Ontario, to utilize many producers' dollars. We also help to reduce the cost of adoption in considering what technology they pick up.

**Mr. Michael Duncan (Natural Sciences and Engineering Research Council Industrial Research Chair, Colleges in Precision Agriculture & Environmental Technologies, Niagara College):** We've done a lot of projects where there's no cost, so we have a kind of pro bono approach. We actually find that the adoption rates are higher when somebody has to pay for something, because they tend to value it more. People who are willing to pay also tend to go deeper into the technology. They're interested in further exploring statistical techniques and different things.

I wouldn't say that the adoption rates of technology are very high right now. There are a lot of farmers who are still doing the blanket fertilizers and blanket coverage, and they don't want IT infrastructure on their farms. They don't want to become IT professionals. As was mentioned in the previous session, there's the thought that we're going to be moving more IT technologists onto farms, but I'm not sure. Each farm is a business and each farmer is the CEO, and whatever philosophy they hold with regard to technology is very hard to overcome. I don't know if money is the thing, or more public infrastructure that they can tap into.

One of the approaches we took very early on was to build cloud-based technology, for the simple reason that it allowed us to project whatever power was necessary, because we can afford the computers and can run them. We have the students who can do the administration, the programming, and all the development of technology that's necessary. Then we can project it right into the farmer's farm, as long as they have a cellphone, a tablet, or a computer of some kind. That eases the adoption of technology by farmers. Because we can provide that service at no expense, it may help them poke around and see what they like doing. We have a crop portal that helps process farm data. We've had it for about three or four years. Is that right?

● (1015)

**Ms. Sarah Lepp:** It's been six years.

**Mr. Michael Duncan:** Oh, okay. I've been there for a long time. Sarah built it, actually.

We've had that in place, and we're getting more farmers coming in, maybe a couple a month, kind of impromptu tire kickers who come and look to see what the technology has to offer. They might continue, or they might pull back and say, "It's really not for me."

**The Chair:** I'll have to stop you there. Thank you.

*Merci*, Monsieur Breton.

Mr. MacGregor, you have six minutes.

**Mr. Alistair MacGregor:** Thank you very much, Chair.

Mr. MacLean, I think our names are having a competition to see who can be more Scottish. We'll do a draw there.

In your opening comments, you made reference to vineyards as one of the areas Niagara College is looking at.

Where I come from, Vancouver Island, the Cowichan Valley is easily home to most of the vineyards on the island. It's a fantastic value-added industry. We're certainly not on the scale of what you see in the Niagara region or in the Okanagan, but it's still a very important local economy for us. Certainly, I know some are interested in seeing their exports go to other countries, because we do have some fantastic wines.

Can you talk a bit about your research, technology, and innovation in vineyards?

**Mr. Gregor MacLean:** We're fortunate to have a 40-acre vineyard at our Niagara on the Lake campus. There are two programs taught there: winemaking and grape production or oenology.

Our work has involved second-to-second weather tracking, with the intention of predicting harmful weather such as cold drops. That's Dr. Duncan's background, weather physics. We've also looked at communications between ground robotics and aerial photography and data capturing, to better understand and predict diseases happening in the vineyard. If a perennial crop dies—temperature could kill it, and disease could kill it—it takes three to four years for production to come back. A lot of it is predictive work. The other piece we're working on is enhancing staff members or team members on the ground with robotics—not replacing them but enhancing them with follow robotics or data-gathering robotics.

**Mr. Michael Duncan:** For the robotics piece, a lot of people are playing with UAVs, which look at grapes from above, and from the top of the canopy you really can't see anything. The idea was that if we had roving robots with cameras pointing upwards, that's where we could see powdery mildew, leafrollers, and all the various diseases that grapes have. It's a much more effective way.

There's going to be a new kind of workforce, I think, a Game Boy kind of approach, with independent rovers moving around the field. You could be in an air-conditioned hut with an enhanced rover running around the field. You could still have people doing the work; they would just have a different kind of job.

● (1020)

**Mr. Alistair MacGregor:** Thank you.

**Mr. Gregor MacLean:** May I add one thing?

**Mr. Alistair MacGregor:** Yes.

**Mr. Gregor MacLean:** I forgot to mention that we're in the midst of acquiring a very exciting piece of technology. It's a small robot that goes between the row lines. We're purchasing it from a company called Korechi, based in Hamilton. The idea is to do prototyping of small robotics and eventually move toward that automation piece.

**Mr. Alistair MacGregor:** Fantastic. You mentioned the work you're doing with a company called SoilOptix and really scaling down the time it takes for them to do an analysis. In my region, we have a company called EIO Diagnostics, a small start-up. They have developed technology that leads to early detection of mastitis. They can scan a dairy herd in a phenomenal amount of time. This technology is meeting with great success in Africa and all around the world. There are a lot of countries really interested in this.

We're doing this study in the context of our exports. Can you talk a bit about this technology and its application worldwide, how we're leaders in this field, and any other bright spots as well?

**Mr. Gregor MacLean:** Yes. We see amazing work on the ground. As all of you on this committee know, farming is not so much a job; it's a lifestyle. For the most part, this is what all the great farmers we know are doing day to day. Typically, they're supported by a couple of amazing outside teams, such as agronomic consultants. In Ontario, we're most familiar with the staff of OMAFRA, the Ontario Ministry of Agriculture, Food and Rural Affairs. They are always doing landscape searches to try to figure out the best technology that's actually affordable as well.

A lot of it is focused on soil health. It has come back to soil organic matter. Sarah is doing a master's right now in soil health mapping. It's to better understand the resources we have here, because even if we reduce all barriers to trade, if our soil depletes, we're very stuck.

**Mr. Alistair MacGregor:** I want to get one last question in to the Alberta Pulse Growers. The committee did a trip in the spring session. Unfortunately, we were not able to make it to Alberta, but one of our stops was in Saskatoon. We visited the Saskatchewan food centre, and we got to taste some of the amazing products they're making out of pulses. It's really an amazing setting in a totally food-secure environment where people can use various rooms for different production, to see if it's actually commercially viable.

I'm wondering if you can talk a bit about some of the stuff you're doing in Alberta with respect to that, because we saw some great promise there. I'm really interested in how the feds can help out with that.

**Ms. Leanne Fischbuch:** Thank you.

Quite often, the Alberta Pulse Growers works in conjunction with our Government of Alberta colleagues at the Food Processing Development Centre in Leduc. It's similar to the centre you visited in Saskatoon. The centre there also has what they call an incubator, so small companies can come in and do some work there to try their products.

In 2016, for the International Year of Pulses, we did a specific project with the Food Processing Development Centre that looked at bringing more companies to the centre to work on inclusion of pulses in their products. From that opportunity we had probably about seven companies come in to take a look at incorporation. It was a bit of a show and tell. They incorporated the product and then we had a chance to taste some of the things. They were very good. They ranged from a jerky type of product to—

**The Chair:** Ms. Fischbuch, I apologize. I have to cut you off again. Perhaps you can continue later.

Mr. Joe Peschisolido, welcome. It's your turn for six minutes.

**Mr. Joe Peschisolido (Steveston—Richmond East, Lib.):** Thank you, Mr. Chair.

It's great to see everyone back from our summer in the ridings.

Madam Fischbuch, if you want to continue your previous answer, you can.

**Ms. Leanne Fischbuch:** Thank you very much.

There was a range of products. It was very interesting to see, because for the companies that came to us for this work it was pretty much their first time using pulses and the ingredients that pulses can provide. Some of it was protein, and some of it was fibre. I think the products were really quite successful.

The challenge is that these small companies now have to go out and try to do this on their own. We encouraged them and provided a bit of funding from our growers for this type of project.

Is there a way to have something on the food processing side of things to encourage more of that trial and error in the development of new products? I think that's something that may have been in the FTP Calgary statement, to work on that. I think there is a good opportunity.

Of course, for Alberta it's small companies and medium-sized enterprises that are working on these types of things. A lot of the large companies have the funds to go out and do that.

Another thing that we are waiting to see is the development of the Protein Industries Canada supercluster, because there could be funds there as well. I think it's important to keep an eye on that for more development of value-added products.

● (1025)

**Mr. Joe Peschisolido:** Madam Fischbuch, last week our agriculture minister, Lawrence MacAulay, along with our chair, Mr. Finnigan, and one of our colleagues, Mr. Longfield, were at an announcement for $11.1 million for research into pulses. How could those funds, perhaps along with other funds, be helpful in attracting more companies into the industry?

**Ms. Leanne Fischbuch:** When we looked at our application for the agriscience cluster funding, we split it into four areas according to the priorities of the industry: working on projects that covered genetic advancement, agronomics, health and sustainability. Within those areas, I think we need to consistently provide a supply of product to the marketplace, which should secure value-added companies to come, because they're going to need that supply to make their products.

As long as our growers can consistently provide that money—

**The Chair:** I'm sorry, Ms. Fischbuch. Again, I have to interrupt. We have a vote that's going to take place in half an hour. Do we want to—

**Mr. Joe Peschisolido:** I want to ask about Nutella. I grew up eating Nutella.

**The Chair:** Do you want to keep on for another five or 10 minutes?

Okay, we're back at it for another five minutes.

Ms. Fischbuch, you might be able to finish. Go ahead.

**Ms. Leanne Fischbuch:** I want to re-emphasize that, as long as our growers can consistently provide a nice supply of the product, that's what food companies want. They want consistency. They want something they can depend on when they move it through their formulations.

The investment, the $11.1 million that came to us, will help us provide that and enable our growers to give that supply to the marketplace, which is attractive.

**Mr. Joe Peschisolido:** Thank you.

Are we going to continue, Mr. Chair?

**The Chair:** That's three minutes.

**Mr. Joe Peschisolido:** Mr. MacLean, thank you. I thoroughly enjoyed your presentation. In particular, I thought about my nonna, my grandma. I loved Nutella, and she would bribe me to eat pulses. I didn't know they were called pulses. They were just beans that I didn't like. Growing up, I had a lot of Nutella sandwiches. Who knew about hazelnuts, expansion, and all of that?

On a slightly more serious note, you were talking about vineyards. In my neck of the woods, in Steveston—East Richmond, we have blueberries. We have quite a few innovative entrepreneurs who are creating lovely blueberry wine. Do you have any projects that we can maybe apply to develop a vineyard based on blueberries?

**Mr. Gregor MacLean:** We've never been approached with that. The Niagara region is pretty spoiled, as Alistair mentioned, in terms of its beautiful climate for vineyards. We do have a food team that does product development of that nature. Basically, at a certain point, with farm land value, it's a bit of a debate on who gets it.

Right now, the vineyards are producing a lot of value. There's a lot of greenhouse value as well, but I imagine that they'd have to show pretty high value to justify the land acquisition.

**Mr. Joe Peschisolido:** You were talking about automation and robotics. Some people view it as a positive; others may view it as a negative. Can you comment a little on that?

**Mr. Michael Duncan:** We've gotten both reactions. People don't want people replaced. At this stage, the way the farms are operating.... We've had conversations with a farmer we work with in the 42nd hour he's been sitting in his combine. They don't have a whole lot of spare employees.

There are a lot of tasks that could be done to improve crop quality that aren't being done because it's too hard to get people to go out in the field. I mean, there's dirt; there are flies, and it's hot. It's really hard work, but a robot could go 24 hours straight. That's what I'm trying to get our robotics partner to do, put a little generator on the thing and make it a kind of hybrid so that it can run 24-7 and have all the sensors you could need to detect powdery mildew or overheating in the crops.

Take soybeans. The soybean is described by Syngenta as a crop that tries to kill itself. The more robust it gets, the hotter it gets, and it dies. A simple idea would be to run smaller robots underneath to detect where the hot areas are and then just shred some leaves above them or something really simple. A lot of these really simple things could be done to help create better crops or create better conditions, and not necessarily replace people.

● (1030)

**The Chair:** Thank you.

I want to thank Niagara College and the Alberta Pulse Growers Commission for being here with us today.

Thanks to all the members as well.

The meeting is adjourned.

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